

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Disorder induced topological transition in graphene with random adatoms¹ EDUARDO CASTRO, CeFEMA, Instituto Superior Técnico, Universidade de Lisboa, Av. Rovisco Pais, 1049-001 Lisboa, Portugal, MARÍA LÓPEZ-SANCHO, MARÍA VOZMEDIANO, Instituto de Ciencia de Materiales de Madrid, CSIC, Cantoblanco, E-28049 Madrid, Spain — Abstract One of the first proposals for a two-dimensional topological insulator was made for graphene, the so called Kane-Mele model, but the very low spin-orbit coupling makes this phase undetectable. It has been suggested that randomly depositing certain heavy adatoms can amplify the effect by many orders, and that a dilute concentration should be enough to open a detectable topological gap. Still lacking, however, is a precise determination of the critical density of random adatoms based in the evolution of the topological index. Based in a finite size analysis of the topological index as a function of the density of randomly distributed adatoms, and also on the localization properties of the system accessed through the Lyapunov exponent, we not only determine the critical density but also establish the nature of this peculiar topological transition.

¹EC acknowledge the financial support of FCT-Portugal through grant No. EXPL/FIS-NAN/1720/2013

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Date submitted: 14 Nov 2014

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